MARINE ECOLOGY
PROGRESS SERIES

Volume 41 (1987)

Editor
Otto Kinne

Ecology Institute
Nordbünte 23 and 30, D-2124 Oldendorf/Luhe
Federal Republic of Germany

Assistant Editor: John Austin, Ecology Institute, Nordbünte 23, D-2124 Oldendorf/Luhe,
Federal Republic of Germany

IR

Inter-Research

1987

Editorial Advisors

Editorial Advisors to 'Marine Ecology – Progress Series' are appointed for a four-year period. They are expected to:

- critically evaluate the scientific merits of manuscripts submitted for publication
- suggest topics and authors for reviews
- select and present suitable high-quality manuscripts
- draw attention to new facts, concepts and methods

In addition to the Editorial Advisors listed below, about 300 referees cooperate anonymously.

ENVIRONMENTAL FACTORS

Alderdice, D., Dr.
Pacific Biological Station, Nanaimo, B.C. V9R 5K6, Canada
Responses to environmental factors

Dring, M. J., Dr.
Botany Dept, The Queen's Univ. of Belfast, Belfast BT7 1NN, Northern Ireland
Physiological ecology of algae

Fisher, N. S., Dr.
Dept of Oceanography, Brookhaven National Laboratory, Upton, Long Island, NY 11973, USA
Physiological ecology of phytoplankton

Fowler, S. W., Dr.
International Laboratory of Marine Radioactivity, Musée Océanographique, MC-98000 Monaco
Environmental effects on invertebrates

Gunkel, W., Dr.
Biologische Anstalt Helgoland, D-2192 Helgoland, Federal Republic of Germany
Marine bacteriology

Haedrich, R. L., Prof.
Memorial University of Newfoundland, St. John's, Nfld. A1B 3X9, Canada
Environmental effects on fishes (incl. deep sea)

Lawrence, J. M., Prof.
Dept of Biology, Univ. of South Florida, Tampa, FL 33620, USA
Physiological ecology of invertebrates

MacLeod, R. A., Prof.
Dept of Microbiology, Faculty of Agriculture, MacDonald College, 21, 111 Lakehore Road, Ste. Anne de Bellevue, P.Q. H9X 1C0, Canada
Physiological ecology of microorganisms

Meyers, S. P., Prof.
Dept of Food Science, Louisiana State Univ., Baton Rouge, LA 70803, USA
Physiological ecology of microorganisms

Morita, R. Y., Prof.
Dept of Microbiology, Oregon State Univ., Corvallis, OR 97331, USA
Marine microbiology

Newell, R. C., Prof.
Institute for Marine Environmental Research, Prospect Place, The Hoe, Plymouth PL1 3DH, England
Environmental relations of intertidal animals

Paasche, E., Prof.
Dept of Biology, Univ. Oslo, Marine Botany, PO Box 1069, Blindern, N-0316 Oslo 3, Norway
Physiological ecology of phytoplankton; primary production; benthic algae

Reed, R. H., Dr.
The University of Dundee, Dept of Biological Sciences, Dundee DD1 3HN, Scotland
Physiological ecology of algae and cyanobacteria; osmotic stress

Rheinheimer, G., Prof.
Institut für Meereskunde, Univ. Kiel, Düsternbrooker Weg 20, D-2300 Kiel, Federal Republic of Germany
Marine microbiology

Riisgård, H. U., Dr.
Odense Universitet, Biologisk Institut, Campusvej 55, DK-5230 Odense M., Denmark
Environmental effects on invertebrates; bioenergetics of suspension feeders

Sammarco, P. W., Dr.
Australian Institute of Marine Science, P M B No. 3, Townsville M.C., Q. 4810, Australia
Experimental ecology; chemical ecology

Scheltema, R. S., Dr.
Woods Hole Oceanographic Institution, Woods Hole, MA 02543, USA
Reproduction of benthic invertebrates

Segal, E., Prof.
Dept of Biology, California State Univ., Northridge, CA 91330, USA
Physiological ecology of invertebrates

Sidell, B. D., Prof.
Dept of Zoology, Univ. of Maine at Orono, Murray Hall, Orono, ME 04469, USA
Physiological ecology and biochemistry of fishes

Southward, A. J., Dr.
Mar. Biol. Ass. U.K, The Laboratory, Citadel Hill, Plymouth PL1 2PB, England
Environmental effects on invertebrates

Syrett, P. J., Prof.
Dept of Botany and Microbiology, University College of Swansea, Singleton Park, Swansea SA2 8PP, Wales, UK
Physiological ecology of phytoplankton; nutrition of algae

Vernberg, J., Prof.
Belle W. Baruch Institute for Marine Biol. and Coastal Res., Univ. of South Carolina, Columbia, SC 29208, USA
Physiological ecology of invertebrates

Winter, J. E., Dr.
Instituto de Zoología, Univ. Austral de Chile, Casilla 567, Valdivia, Chile
Physiological ecology of invertebrates

Woodhead, D. S., Dr.
Ministry of Agriculture, Fisheries and Food, Fisheries Radiobiological Lab., Hamilton Dock, Lowestoft, Suffolk NR32 1DA, England
Effects of radioactivity; behavior and distribution of radionuclides

PHYSIOLOGICAL MECHANISMS

Alderdice, D., Dr.
Pacific Biological Station, Nanaimo, B. C. V9R 5KR, Canada
Resistance to stress including pollution; regulation; adaptation

Batty, R. S., Dr.
Dunstaffnage Marine Research Laboratory, PO Box 3, Oban, Argyll PA34 3AD, Scotland
Behavioral physiology of fish; feeding; predation of fish larvae

Bayne, B. L., Dr.
Institute for Marine Environmental Research, Prospect Place, The Hoe, Plymouth PL1 3DH, England
Comparative physiology

Beardmore, J. A., Prof.
Univ. College of Swansea, Dept of Genetics, Singleton Park, Swansea SA2 8PP, Wales, UK
Adaptation; selection

Bulnheim, H.-P., Prof.
Biologische Anstalt Helgoland, Notkestr. 31, D-2000 Hamburg 52, Federal Republic of Germany
Metabolic performance of invertebrates; reproductive biology and sexuality

Costlow, J. D., Jr., Prof.
Duke University Marine Laboratory, Pivers Island, Beaufort, NC 28516, USA
Developmental physiology; endocrinology

Enright, J. T., Prof.
Scripps Institution of Oceanography, San Diego, PO Box 1529, La Jolla, CA 92093, USA
Biological rhythms

Forward, R. B., Jr., Dr.
Duke University Marine Laboratory Pivers Island, Beaufort, NC 28516–9721, USA
Environmental zoo-physiology; behavior; biological rhythms

Gerking, S. D., Prof.
Dept of Zoology, Arizona State Univ.,Tempe, AZ 85281, USA
Fish physiology

Holland, N. D., Prof.
Scripps Institution of Oceanography, San Diego, PO Box 1529, La Jolla, CA 92093, USA
Comparative, cellular and developmental physiology

Humphrey, G. F., Dr.
CSIRO Marine Biochemistry, Building A12, Sydney Univ., N.S.W. 2006, Australia
Photosynthesis; plankton biochemistry

Levandowsky, M., Dr.
Haskins Laboratories at Pace Univ., 41 Park Row, New York, NY 10038, USA
Chemosensory behavior; mathematical models

Naylor, E., Prof.
School of Animal Biology, Univ. Coll. North Wales, Bangor, Gwynedd L57 2UW, Wales, UK
Behavioural physiology; invertebrate biology

Puiseux-Dao, S., Prof.
Laboratoire de Cytophysiologia végétale et de Toxicologie cellulaire, Université de Paris VII, 2, Place Jussieu, F-75251 Paris Cedex 05, France
Ecophysiology and toxicology of algae; cellular biology; behavior of algae

Zhirmunsky, A. V., Prof.
Institute of Marine Biology, Academy of Sciences, Vladivostok 690022, USSR
Mechanisms of cellular resistance and control

CULTIVATION

Bardach, J. E., Prof.
Dept of Geography, Univ. Hawaii at Manoa, 2424 Maile Way, Honolulu, HI 96822, USA
General aspects of cultivation; aquaculture

Lawrence, J. M., Prof.
Dept of Biology, Univ. of South Florida, Tampa, FL 33620, USA
Nutrition of invertebrates

Levandowsky, M., Dr.
Haskins Laboratories at Pace Univ., 41 Park Row, New York, NY 10038, USA
Microcosm cultures

Meyers, S. P., Prof.
Dept of Food Science, Louisiana State Univ., Baton Rouge, LA 70803, USA
Cultivation of microorganisms and crustaceans; aquaculture; microenvironments

Paffenhöfer, G.-A., Prof.
Skidaway Institute of Oceanography, Univ. System of Georgia, PO Box 13687, Savannah, GA 31416, USA
Cultivation of zooplankton

Pandian, T. J., Prof.
School of Biological Sciences, Madurai Kamaraj Univ., Madurai 625 021, Tamilnadu, India
Cultivation of decapods and fishes; bioenergetics

Rheinheimer, G., Prof.
Institut für Meereskunde, Univ. Kiel, Düsternbrooker Weg 20, D-2300 Kiel, Federal Republic of Germany
Cultivation of microorganisms

Rosenthal, H., Dr.
Biologische Anstalt Helgoland, Notkestr. 31, D-2000 Hamburg 52, Federal Republic of Germany
Cultivation of and environmental effects on fish; early life history of fish

Tseng, C. K., Prof.
Institute of Oceanology, Academia Sinica, 7 Nan-Hai Road, Qingdao, People's Republic of China
Aquaculture of seaweeds; seaweed resources; photosynthesis

Westernhagen, H. von, Dr.
Biologische Anstalt Helgoland, Notkestr. 31, D-2000 Hamburg 52, Federal Republic of Germany
Cultivation of crustaceans and fishes

Wildish, D. J., Dr.
Fisheries and Environmental Sciences, Biological Station, St. Andrews, N. B. EOG 2X0, Canada
Bivalve aquaculture

Winter, J. E., Dr.
Instituto de Zoología, Univ. Austral de Chile, Casilla 567, Valdivia, Chile
Cultivation of invertebrates

DYNAMICS

Arndt, E. A., Prof.
Wilhelm-Pieck-Universität Rostock, Sektion Biologie, Freiligrathstr. 7/8, DDR-2500 Rostock, German Democratic Republic
Ecological dynamics of brackish waters

Bak, R. P. M., Dr.
Nederlands Instituut voor Onderzoek der Zee, Postbox 59, 1790 AB Den Burg – Texel, The Netherlands
Coral-reef ecology

Banse, K., Prof.
School of Oceanography, WB-10, Univ. Washington, Seattle, WA 98195, USA
Biological oceanography; plankton research

Berman, T., Prof.
Israel Oceanographic & Limnological Research Ltd., Tel Shikmona, PO Box 8030, Haifa 31080, Israel
Phytoplankton ecology

Bianchi, A., Dr.
C.N.R.S. ER 223, Microbiologie Marine, Campus de Luminy – case 907, 70, route Léon Lachamp, F-13288 Marseille Cedex 9, France
Marine microbiology; ecological dynamics

Birkeland, C., Prof.
Univ. of Guam, Marine Laboratory, UOG Station, Mangilao, Guam 96913
Coral-reef ecology; benthic ecology

Bonner, W. N., Mr.
British Antarctic Survey, High Cross Madingley Rd, Cambridge CB3 OET, England
Polar ecology; marine mammal ecology

Bunt, J. S., Dr.
Australian Institute of Marine Science, PO-Box 422, Malanda, Q. 4885, Australia
Mangrove systems; reef studies

Conover, R. J., Dr.
Marine Ecology Laboratory, Bedford Institute of Oceanography, PO Box 1006, Dartmouth, N.S. B2Y 4A2, Canada
Zooplankton biology, physiology, biochemistry

Cushing, D. H., Dr.
Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk NR33 OHT, England
Productivity of the sea; fish-population dynamics; biological oceanography

Fenchel, T., Prof.
Marine Biological Laboratory (University of Copenhagen), DK-3000 Helsingør, Denmark
Population biology; microbial ecology

Field, J. G., Prof.
University of Cape Town, Zool. Dept, Rondebosch 7700, Republic of South Africa
Dynamics of nearshore ecosystems

Floc'h, J. Y., Dr.
Lab. de Physiologie Végétale, Faculté des Sciences, Ave Victor le Gorgeau, F-29283 Brest Cedex, France
Nutrition of macroalgae

Furness, R. W., Dr.
Department of Zoology, The University of Glasgow, Glasgow G12 8QQ, Scotland
Ecology of sea birds

Gage, J. D., Dr.
Dunstaffnage Marine Research Laboratory, PO Box 3, Oban, Argyll PA34 4AD, Scotland
Benthos of deep sea and temperate coasts

Gerlach, S. A., Prof.
Institut für Meereskunde, Düsternbrooker Weg 20, D-2300 Kiel, Federal Republic of Germany
Benthos ecology

Golikov, A. N., Dr.
Zoological Institute, Academy of Sciences, Leningrad V-164, USSR
Biocoenoses; speciation; evolution

Gray, J., Prof.
Institutt for Marinbiologi og Limnologi, Univ. Oslo, Postboks 1064, Blindern, Oslo 3, Norway
Soft-sediment ecology

Haedrich, R. L., Prof.
Memorial University of Newfoundland, St. John's, Nfld. A1B 3X9, Canada
Zoogeography; natural history of fish

Harding, G. C., Dr.
Marine Ecology Laboratory, Bedford Institute of Oceanography, PO Box 1006, Dartmouth, N.S. B2Y 4A2, Canada
Crustacean ecology (incl. deep sea)

Harris, G. P., Dr.
CSIRO Marine Laboratories, Division of Fisheries Research, Division of Oceanography, Castray Esplanade, G.P.O. Box 1538 Hobart, Tas. 7001, Australia
Phytoplankton ecology: community structure, pollution dynamics, productivity

Hessler, R. R., Dr.
Scripps Institution of Oceanography, San Diego, PO Box 1529, La Jolla, CA 92093, USA
Deep-sea ecology; benthic ecology; palaeontology

Hoek, C. van den, Prof.
Biol. Centrum der Rijksuniversiteit te Groningen, Afd. Plantensystematiek, Kerklaan 30, 9750 AA Haren (Gr.), The Netherlands
Phytogeography; life cycles of algae

Holm-Hansen, O., Dr.
Scripps Inst. of Oceanography, Univ. of California, La Jolla, CA 92093, USA
Polar ecology; chemical oceanography; photosynthesis

Hughes, R. N., Dr.
School of Animal Biology, Univ. College North Wales, Bangor, Gwynedd LL57 2UW, Wales, UK
Ecological energetics (particularly feeding)

Kühlmann, D., Dr.
Museum für Naturkunde der Humboldt-Univ., Invalidenstr. 43, DDR-104 Berlin, German Democratic Republic
Coral-reef ecology; coral evolution

Landry, M. R., Dr.
Dept of Oceanography, Univ. of Hawaii, Manoa, 1000 Pope Rd, Honolulu, HI 96822, USA
Food web interactions; zooplankton ecology

Lawrence, J. M., Prof.
Dept of Biology, Univ. of South Florida, Tampa, FL 33620, USA
Reproduction of invertebrates; nutrition

LeBrasseur, R. J., Dr.
Pacific Biological Station, Nanaimo, B. C. V9R 5K6, Canada
Feeding ecology of fishes; biological oceanography

Levandowsky, M., Dr.
Haskins Laboratories at Pace Univ., 41 Park Row, New York, NY 10038, USA
Ecological modelling; phytoplankton ecology

Levings, C., Dr.
West Vancouver Laboratory, 4160 Marine Drive, West Vancouver, B.C. V7V 1N6, Canada
Estuarine ecology of macrobenthos and fish

Lewis, J. B., Dr.
Dept of Biology, McGill Univ., Stewart Biology Bldg, 1205 Dr. Penfield, Montreal, Quebec H3A 1B1, Canada
Coral-reef ecology; tropical marine biology

Lewis, M. R., Dr.
Dept of Oceanography, Dalhousie University, Halifax, N. S. B3H 4J1, Canada
Biological oceanography; phytoplankton physiology; modelling of physical and biological processes

Mauchline, J., Dr.
Scottish Marine Biological Ass., Dunstaffnage Marine Res. Lab., POB 3, Oban, Argyll PA34 4AD, Scotland
Deep-sea ecology; radioactive pollution

Neushul, M., Prof.
Dept of Biological Sciences, Univ. of California, Santa Barbara, CA 93106, USA
Ecology of benthos algae; marine macrophytes

Newell, S. Y., Dr.
The University of Georgia, Marine Institute, Sapelo Island, GA 31327, USA
Ecology of fungi and bacteria; decomposition

Nixon, S. W., Prof.
Univ. Rhode Island, Graduate School of Oceanogr., Narragansett Bay Campus, Kingston, RI 02882-1197, USA
Coastal ecology; nutrient dynamics; wetlands; geochemistry; numerical models; mesocosms

Nybakken, J., Prof.
Moss Landing Marine Laboratories, California State Univ., PO Box 450, Moss Landing, CA 95039-0450, USA
Ecology of molluscs; community structure of soft-sediment invertebrates

Omori, M., Dr.
Tokyo University of Fisheries, Research Lab. of Fisheries Resources, 4-5-7, Konan, Minato-ku, Tokyo, 108, Japan
Biological oceanography; zooplankton

Paffenhöfer, G.-A., Prof.
Skidaway Institute of Oceanography, Univ. System of Georgia, PO Box 13687, Savannah, GA 31416, USA
Zooplankton ecology

Parsons, T. R., Prof.
Dept of Oceanography, Univ. of British Columbia, 6270 University Boulevard, Vancouver, B.C. V6T 1W5, Canada
Biological oceanography; mathematical modelling

Pearse, J. S., Prof.
Center for Coastal Marine Studies, Univ. of California, Santa Cruz, CA 95064, USA
Kelp forest ecology; reproductive ecology

Peterson, C. H., Prof.
Institute of Marine Science, Univ. N. Carolina at Chapel Hill, 3407 Arendell Street, Morehead City, NC 28557, USA
Marine benthic ecology; population biology

Pichon, M., Prof.
Australian Institute of Marine Science, PMB No 3, Townsville MC, Qld. 4810, Australia
Coral-reef ecology; shallow-water tropical communities

Platt, T., Dr.
Marine Ecology Laboratory, Bedford Institute of Oceanography, PO Box 1006, Dartmouth, N.S. B2Y 4A2, Canada
Phytoplankton ecology; primary production

Rao, T. S. S., Dr.
National Institute of Oceanography, Biol. Div., Dona Paula – 403 004, Goa, India
Biological oceanography

Reise, K., Dr.
Biologische Anstalt Helgoland, D-2282 List/Sylt, Federal Republic of Germany
Benthos ecology

Sammarco, P. W., Dr.
Australian Institute of Marine Science, P M B No. 3, Townsville M.C., Q. 4810, Australia
Coral-reef ecology; benthic community ecology; ecology of fishes, echinoderms, coelenterates

Savidge, G., Dr.
The Queen's Univ. of Belfast, Marine Biology Station, The Strand, Portaferry, Co. Down, Northern Ireland
Phytoplankton ecology; primary production; photosynthesis

Scarlato, O., Prof.
Zoological Institute, Academy of Sciences, Leningrad, V-164, USSR
Dynamics of biocoenoses

Scheltema, R. S., Dr.
Woods Hole Oceanographic Institution, Woods Hole, MA 02543, USA
Reproduction, biogeography, and evolution of benthic invertebrates

Schneider, D. C., Dr.
Newfoundland Institute for Cold Ocean Science, Memorial University of Newfoundland, St. John's, Newfoundland A1B 3X7, Canada
Dynamics of large organisms; ecology of sea birds

Sherr, B. & E., Drs
The University of Georgia, Marine Institute, Sapelo Island, GA 31327, USA
Microbial food webs; trophic roles of phagotrophic protozoans

Skjoldal, H. R., Dr.
Institute of Marine Research, Postboks 1870, N-5011 Bergen-Nordnes, Norway
Food webs and trophic interactions

Southward, A. J., Dr.
Mar. Biol. Ass. U. K., The Laboratory, Citadel Hill, Plymouth PL1 2PB, England
Rocky-coast ecosystems; deep-sea ecosystems

Stoecker, D. K., Dr.
Woods Hole Oceanographic Institution, Woods Hole, MA 02543, USA
Microzooplankton, particularly ciliates; secondary production

Tenore, K. R., Prof.
Chesapeake Biological Laboratory, PO Box 38, Solomons, MD 20688-0038, USA
Benthic ecology and bioenergetics; production; food chains of detritus-based systems

Thayer, G. W., Dr.
Ecosystem Structure Branch, Southeast Fisheries Center, Beaufort, NC 28516-9722, USA
Wetlands ecology, incl. submerged seagrasses and emergent marshes; production and utilization of detritus

Tseng, C. K., Prof.
Institute of Oceanology, Academia Sinica, 7 Nan-Hai Road, Qingdao, People's Republic of China
Ecology of seaweeds

Underwood, A. J., Dr.
School of Biol. Sci., Univ. Sydney, Zoology Building, Sydney, N.S.W. 2006, Australia
Experimental intertidal and subtidal ecology; behavior; life cycles of sessile invertebrates

Wildish, D. J., Dr.
Fisheries and Environmental Sciences, Biological Station, St. Andrews, N. B., EOG 2X0, Canada
Benthic ecology; habitat assessment

Vinogradov, M. E., Prof.
P. P. Shirshov Institute of Oceanology, Academy of Sciences of USSR, 1, Letnaya (Ljublino), Moscow 109387, USSR
Oceanic plankton ecosystems; deep-sea amphipods; biological oceanography

Wangersky, P. J., Prof.
Dept of Oceanography, Dalhousie Univ., Halifax, N.S., B3H 4J1, Canada
Organic matter in sea water; theoretical population dynamics; geochemistry; chemical oceanography

Warwick, R. M., Dr.
Institute for Marine Environmental Research, Prospect Place, The Hoe, Plymouth PL1 3DH, England
Structure and functioning of benthic communities; meiofaunal ecology; energy flow

Williams, R., Dr.
Institute for Marine Environmental Research, Prospect Place, The Hoe, Plymouth PL1 3DH, England
Plankton ecology; community structure, population dynamics

Zijlstra, J. J., Dr.
Nederlands Instituut voor Onderzoek der Zee, Postbox 59, 1790 AB Den Burg – Texel, The Netherlands
Food webs; population dynamics

OCEAN MANAGEMENT

Alderdice, D., Dr.
Pacific Biological Station, Nanaimo, B.C. V9R 5KR, Canada
Pollution of marine environments

Bardach, J. E., Prof.
Dept of Geography, Univ. Hawaii at Manoa, 2424 Maile Way, Honolulu, HI 96822, USA
Management of tropical marine environments; fisheries

Bayne, B. L., Dr.
Institute for Marine Environmental Research, Prospect Place, The Hoe, Plymouth PL1 3DH, England
Stress and pollution

Beardmore, J. A., Prof.
Univ. College of Swansea, Dept of Genetics, Singleton Park, Swansea SA2 8PP, Wales, UK
Genetic effects of pollution; stock improvement

Bernhard, M., Dr.
ENEA, PO Box 316, I-19100 La Spezia, Italy
Radioactive and conventional pollution

Bravo de Laguna, J., Dr.
Instituto Español de Oceanografia, Alcalá, 27–4^0, E-28014 Madrid, Spain
Fishery biology; stock assessment

Bryan, G. W., Dr.
Mar. Biol. Ass. U.K., The Laboratory, Citadel Hill, Plymouth PL1 2PB, England
Heavy metal pollution; estuarine chemistry

Eisler, R., Dr.
U.S. Dept of the Interior, Fish and Wildlife Service, Office of Biol. Services, Washington, D.C., 20240, USA
Toxicology and pollution

Fisher, N. S., Dr.
Dept of Oceanography, Brookhaven National Laboratory, Upton, Long Island, NY 11973, USA
Pollutant effects on plankton; radioecology

Fowler, S. W., Dr.
International Laboratory of Marine Radioactivity, Museé Océanographique, MC-98000 Monaco
Pollution effects on zooplankton; radioecology

Gray, J., Prof.
Institutt for Marinbiologi og Limnologi, Univ. Oslo, Postboks 1064, Blindern, Oslo 3, Norway
Pollution effects on benthos animals

Gulland, J. A., Dr.
Marine Resources Assessment Group, Centre for Environmental Technology, Imperial College, 48 Prince's Gardens, London SW7 1LU, England
Management of fishery resources

Gunkel, W., Dr.
Biologische Anstalt Helgoland, D-2192 Helgoland, Federal Republic of Germany
Oil degradation; oil pollution

Lasker, R., Dr.
US Dept of Commerce, NOAA, Southwest Fisheries Center, PO Box 271, La Jolla, CA 92038, USA
Fishery biology; fishery resources

Mauchline, J., Dr.
Scottish Marine Biological Ass., Dunstaffnage Marine Res. Lab., PO Box 3, Oban, Argyll PA34 4AD, Scotland
Radioactive pollution

Polikarpov, G. G., Prof.
Institute of Biology of South Seas, Academy of Sciences Uk. SSR, 2, Nahimov St., Sevastopol 335000, USSR
Chemical ecology, radioecology, radiotracers, pollution; protection of sea life

Riley, J. P., Prof.
Dept of Oceanography, Univ. of Liverpool, Liverpool L69 3BX, England
Marine pollution chemistry; chemical oceanography

Sherman, K., Dr.
US Dept of Commerce, NOAA, Northeast Fisheries Center, South Ferry Rd, Narragansett, RI 02882, USA
Fisheries ecology; fishery resources; zooplankton

Zijlstra, J. J., Dr.
Nederlands Instituut voor Onderzoek der Zee, Postbox 59, 1790 AB Den Burg – Texel, The Netherlands
Management of wadden-sea areas

MARINE ECOLOGY – PROGRESS SERIES

HISTORY: 'Marine Ecology – Progress Series' (MEPS) was established in response to requests from numerous marine ecologists from all over the world. The series is based on 'Marine Ecology' – the first comprehensive, integrated treatise on life in oceans and coastal waters – conceived, organized and edited by Professor Otto Kinne, and published by John Wiley & Sons.

AIM: 'Marine Ecology – Progress Series' serves as a world-wide forum for all aspects of marine ecology, fundamental and applied. The journal covers microbiology, botany, zoology, ecosystem research, biological oceanography, fisheries, aquaculture, pollution, environmental protection, conservation and resource management.
Ecological research has become of paramount importance for man's future. The information presented here should, therefore, encourage critical application of ecological knowledge for the benefit of mankind and, in fact, of life on earth. 'Marine Ecology – Progress Series' strives for

- ◯ complete coverage of the field of marine ecology
- ◯ the highest possible quality of papers
- ◯ quick publication
- ◯ a high technical standard of presentation.

Editor and publisher attempt to achieve these goals in close cooperation with editorial advisors, referees, contributors and readers. Criticism and advice are cordially invited (please address to the editor).

SCOPE: 'Marine Ecology – Progress Series' is international and interdisciplinary. Presenting research articles, reviews and notes, it has been created for prompt publication of contributions concerned with:

Environmental Factors: Tolerances and responses of marine organisms (microorganisms, autotrophic plants, and animals) to variations in abiotic and biotic components of their environment; radioecology.

Physiological Mechanisms: Synthesis and transversion of organic material (mechanisms of auto- and heterotrophy); thermo-, ion-, osmo- and volume-regulation; stress resistance; non-genetic and genetic adaptation; population genetics; orientation in space and time; migrations; behavior.

Cultivation: Maintenance and rearing of, as well as experimentation with, marine organisms under environmental and nutritional conditions which are, to a considerable degree, controlled; analysis of the physiological and ecological potential of individuals, populations and species; determination of nutritional requirements; ecological aspects of aquaculture; water-quality management; culture technology.

Dynamics: Production, transformation, and decomposition of organic matter in marine ecosystems; food webs; trophic interrelations; population dynamics; plankton ecology; benthos ecology; estuarine and coastal ecology; wadden-sea ecology; coral-reef ecology; deep-sea ecology; open-ocean ecology; polar ecology; theoretical ecology; ecological modelling.

Ocean Management: Applied marine field ecology; inventory, protection and management of living resources in coastal areas, estuaries and open oceans; ecological aspects of fisheries; pollution of marine areas and organisms; protection of life in the seas; management of populations, species and ecosystems; management of coastal zones and sea areas.

Subscription Information

1987: 7 volumes (35–41), 3 issues per volume
Subscribers in North America: US $ 157 per volume.
Annual rate for 7 volumes: US $ 1099 including postage, handling and insurance.

Subscribers in all other countries: DM 286 per volume.
Annual rate for 7 volumes: DM 2002 plus postage, handling and insurance.

1988: 8 volumes (42–49), 3 issues per volume
DM 310 per volume.
Annual rate for 8 volumes: DM 2480 including postage, handling and insurance.

Special Conditions (for personal use of individual scientists only)
(1) Advisors: free copies.
(2) Staff referees: DM 48 per volume, providing their institutional library subscribes to the journal.
(3) All other scientists: DM 85 per volume, providing their institutional library subscribes to the journal.
(4) Students: DM 75 per volume, providing their university library subscribes to the journal.

Subscriptions are entered with annual prepayment only. They should be addressed to Inter-Research, PO Box 1120, D-2124 Amelinghausen, F.R.G.

Missing issues must be claimed within 4 months after publication.

Publisher: Inter-Research, PO Box 1120, D-2124 Amelinghausen, Federal Republic of Germany.

Advertisements

1/1 page	ready-to-print film	= US $ 70	1/2 page	ready-to-print film	= US $ 38
	proof-requiring text	= US $ 100		proof-requiring text	= US $ 60

As a service to science, announcements of important scientific meetings are printed free of charge.

Copyright © Inter-Research, Amelinghausen, 1987. All rights reserved. Mar. Ecol. Prog. Ser. 1987. Printed by Westholsteinische Verlagsdruckerei Boyens & Co., D-2240 Heide.

Manuscript Preparation, Mailing and Processing

Preparation

Research articles (in general not exceeding 10 printed pages), reviews (up to 30 printed pages) and notes (1 to 3 printed pages) must be typewritten with double spacing. 'Marine Ecology – Progress Series' invites interpretative rather than descriptive contributions. Reviews should be critical, instructive evaluations of the state-of-the-art – not mere compilations of information.

Abstracts All contributions must be preceded by a brief, concise abstract. In the shortest possible way, the abstract should outline the scope of the paper and highlight its main results and conclusions.

Figures must be very carefully prepared, numbered and accompanied by brief, precise legends. For examples consult recent issues. Mark desired position of figures in the manuscript margin.

Tables should not be excessive in size. They must be numbered and be headed by brief, compendious legends. Mark desired position of tables in the manuscript margin. Unusual symbols used must be explained.

Genus and species names: underline for *italics*. Genus names should appear in full the first time mentioned in a given paragraph.

Citation of literature All literature quoted in the text must be listed, in alphabetical order of author names, at the end of the manuscript. Please abbreviate publications according to 'World List of Scientific Periodicals', latest edition, London. For examples of literature citation see below.

Mailing

Address manuscripts (original plus 2 copies) to the editor or to an editorial advisor. For safety use registered mail.

Processing

Manuscripts are critically evaluated by at least 3 reviewers. The editor then decides on acceptance or rejection. Acceptable manuscripts are usually returned to the author requesting consideration of comments and criticism. Present rejection rates range from 35 to 50 % for manuscripts from different parts of the world.

When an accepted manuscript is ready for publication, the author will be notified and the date of manuscript acceptance fixed. This date appears at the end of each printed contribution. Average time between acceptance and publication is 3 mo.

The author receives 2 sets of proofs directly from the printer. Printing errors must be carefully corrected. At this stage, stylistic changes are not acceptable without compensatory payment. Please return 1 set of proofs by air mail.

Offprints: Forty offprints (reprints) of each contribution will be made available free of charge. Additional offprints can be purchased. For offprint prices consult the form accompanying the proofs. Orders for additional offprints must be made when returning the proof (use the form provided).

'Marine Ecology – Progress Series' levies no page charge.
The last issue of each set of 10 volumes features a combined author/title index.

Examples of Literature Citation

Periodicals

LaRoche, J., Harrison, W. G. (1987). Compartmental models of nitrogen cycling in tropical and temperate marine environments. Mar. Ecol. Prog. Ser. 38: 137-149

Books

Fenchel, T. (1987). Ecology - potentials and limitations. In: Kinne, O. (ed.) Excellence in ecology 1. Ecology Institute, Oldendorf/Luhe, FRG

Rheinheimer, G. (1985). Aquatic microbiology, 3rd edn. VEB Gustav Fischer Verlag, Jena

Papers from books

Margalef, R. (1978). General concepts of population dynamics and food links. In: Kinne, O. (ed.) Marine ecology, Vol. IV, Dynamics. Wiley, Chichester, p. 617-704

Copyright

With the acceptance of a manuscript, the copyright is transferred to the publishers. Reproduction of any part of this publication by any means, as well as translation, requires their written permission. Trade marks or names appearing in this series may be subject to protective regulations or laws. The Article Fee Code (at the bottom of the first page of each paper) indicates the copyright holder's consent that, in the USA, copies of the paper may be made for personal or internal use. This consent is granted on condition that the copier pay the stated fee through the Copyright Clearance Center, Inc., PO Box 8891, Boston, Mass. 02114, for copying beyond that permitted by Section 107 or 108 of the US Copyright Law.

CONTENTS

Volume 41 · Number 1 · 1987

RESEARCH ARTICLES

Roberts, C. M., Ormond, R. F. G.
Habitat complexity and coral reef fish diversity and abundance on Red Sea fringing reefs 1–8

Grant, W. S., Leslie, R. W., Becker, I. I.
Genetic stock structure of the southern African hakes *Merluccius capensis* and *M. paradoxus* 9–20

Shaw, P. W., Beardmore, J. A., Ryland, J. S.
Sagartia troglodytes (Anthozoa: Actiniaria) consists of two species 21–28

Harding, G. C., Pringle, J. D., Vass, W. P., Pearre, S., Jr., Smith, S. J.
Vertical distribution and daily movements of larval lobsters *Homarus americanus* over Browns Bank, Nova Scotia 29–41

Kimmerer, W. J., McKinnon, A. D.
Zooplankton in a marine bay. I. Horizontal distributions used to estimate net population growth rates 43–52

Kimmerer, W. J., McKinnon, A. D.
Zooplankton in a marine bay. II. Vertical migration to maintain horizontal distributions 53–60

Crowe, W. A., Josefson, A. B., Svane, I.
Influence of adult density on recruitment into soft sediments: a short-term *in situ* sublittoral experiment 61–69

Matson, E. A., Buck, J. D.
Community electron transport of procaryotes in euryoxic estuarine sediment 71–78

Kemp, W. M., Murray, L., Borum, J., Sand-Jensen, K.
Diel growth in eelgrass *Zostera marina* 79–86

Pezeshki, S. R., DeLaune, R. D., Patrick, W. H., Jr.
Effects of flooding and salinity on photosynthesis of *Sagittaria lancifolia* 87–91

Nultsch, W., Pfau, J., Materna-Weide, M.
Fluence and wavelength dependence of photoinhibition in the brown alga *Dictyota dichotoma* 93–97

NOTE

Schneider, G.
Role of advection in the distribution and abundance of *Pleurobrachia pileus* in Kiel Bight 99–102

Volume 41 · Number 2 · 1987

RESEARCH ARTICLES

Baker, C. S., Perry, A., Herman, L. M.
Reproductive histories of female humpback whales *Megaptera novaeangliae* in the North Pacific 103–114

Costello, M. J., Myers, A. A.
Amphipod fauna of the sponges *Halichondria panicea* and *Hymeniacidon perleve* in Lough Hyne, Ireland 115–121

Kurihara, Y., Okamoto, K.
Cannibalism in a grapsid crab, *Hemigrapsus penicillatus* 123–127

Galzin, R.
Structure of fish communities of French Polynesian coral reefs. I. Spatial scales 129–136

Galzin, R.
Structure of fish communities of French Polynesian coral reefs. II. Temporal scales 137–145

Hopkinson, C. S., Jr, Sherr, B. F., Ducklow, H. W.
Microbial regeneration of ammonium in the water column of Davies Reef, Australia 147–153

Joint, I. R., Pomroy, A. J.
Activity of heterotrophic bacteria in the euphotic zone of the Celtic Sea 155–165

Zimmerman, R. C., Smith, R. D., Alberte, R. S.
Is growth of eelgrass nitrogen limited? A numerical simulation of the effects of light and nitrogen on the growth dynamics of *Zostera marina* 167–176

Seitzinger, S. P.
Nitrogen biogeochemistry in an unpolluted estuary: the importance of benthic denitrification 177–186

Oviatt, C. A., Quinn, J. G., Maughan, J. T., Ellis, J. T., Sullivan, B. K., Gearing, J. N., Gearing, P. J., Hunt, C. D., Sampou, P. A., Latimer, J. S.
Fate and effects of sewage sludge in the coastal marine environment: a mesocosm experiment 187–203

Volume 41 · Number 3 · 1987

RESEARCH ARTICLES

Taggart, C. T., Leggett, W. C.
Short-term mortality in post-emergent larval capelin *Mallotus villosus.* I. Analysis of multiple *in situ* estimates 205–217

Taggart, C. T., Leggett, W. C.
Short-term mortality in post-emergent larval capelin *Mallotus villosus.* II. Importance of food and predator density, and density-dependence 219–229

Rosso, A. L., Azam, F.
Proteolytic activity in coastal oceanic waters: depth distribution and relationship to bacterial populations 231–240

Painchaud, J., Lefaivre, D., Therriault, J.-C.
Box model analysis of bacterial fluxes in the St. Lawrence Estuary 241–252

Coffin, R. B., Sharp, J. H.
Microbial trophodynamics in the Delaware Estuary 253–266

Spies, A.
Growth rates of Antarctic marine phytoplankton in the Weddell Sea 267–274

Sakshaug, E., Demers, S., Yentsch, C. M.
Thalassiosira oceanica and *T. pseudonana:* two different photoadaptational responses 275–282

Orth, R. J., van Montfrans, J.
Ultilization of a seagrass meadow and tidal marsh creek by blue crabs *Callinectes sapidus.* I. Seasonal and annual variations in abundance with emphasis on post-settlement juveniles 283–294

Eskin, R. A., Coull, B. C.
Seasonal and three-year variability of meiobenthic nematode populations at two estuarine sites 295–303